FAST FACTS
CHLORINE

Missouri Department of Health and Senior Services
Hazardous Substance Emergency Events Surveillance (HSEES) Program

Synonyms: Bertholite
Molecular chlorine

CAS Number: 7782-50-5

DOT Number: UN1017

DOT Designation: Nonflammable gas, poison and oxidizer

Hazard Rating	NFPA
HEALTH	4
FLAMMABILITY	0
REACTIVITY	0
• Containers may explode in fire • Strong oxidizer – contact with other materials may cause a fire	

Hazard Rating Key:
0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

Exposure Levels

- Breathing chlorine can irritate the lungs, causing coughing and/or shortness of breath.
- Prolonged exposure to low concentrations of chlorine may produce chloracne.
- Repeated exposures or a single high exposure may permanently damage the lungs. It can also damage the teeth and cause a skin rash.
- Exposure to 10 parts per million (ppm) is immediately dangerous to life and health.

Characteristics and Potential Exposures

Chlorine is a greenish-yellow gas with a strong, irritating odor which is often used in a solution. It is used in making other chemicals, such as disinfectant, in bleaching, and for purifying water and sewage.

Gaseous chlorine is a bleaching agent used in the paper, pulp and textile industries for bleaching cellulose for artificial fibers. It is also used in the manufacture of chlorinated lime, inorganic and organic compounds such as metallic chlorides, chlorinated solvents, refrigerants, pesticides and polymers.

Chlorine Releases in Missouri

During calendar years 1994-1998, 1,071 HSEES events were reported in Missouri. Of those, 14 events involved the release of chlorine. Quantities released ranged from seven pounds to one ton. All chlorine releases occurred in fixed facilities.

Injuries were sustained by 36 people during five events. Evacuations were ordered in five events and resulted in the evacuation of 930 individuals from their homes or places of work.

Interesting Event

Ancillary process equipment which utilized chlorine at an automobile manufacturer was improperly filled, allowing seven pounds of chlorine to be released into the air inside the facility. A total of 29 employees suffered from respiratory irritation, eye irritation, gastrointestinal problems, and dizziness. All of the individuals injured were at least 100 feet from the site of the release.

Fourteen victims were admitted to a hospital, while the remaining fifteen victims were treated at a hospital and released. All 29 victims were also decontaminated at the scene. In addition, 40 employees were evacuated from the area for eight hours.

Health Hazard Information

- Exposure to chlorine by inhalation can irritate the nose and throat, causing tearing, coughing, sputum, bloody nose and chest pain.
- Chlorine reacts with body moisture to form acids. It is extremely irritating to skin, eyes and mucous membranes, and may cause corrosion of the teeth.
- Chlorine in high concentrations acts as an asphyxiant by causing cramps in the muscles of the larynx, swelling of the mucous membranes, nausea, vomiting, anxiety and syncope.

Personal Protective Equipment Guidelines

- Avoid skin contact with chlorine. Wear protective gloves and clothing as recommended for your operation.

- Where exposure to cold equipment, vapors or liquid may occur, employees should be provided with special clothing designed to prevent the freezing of body tissues.
- Wear splash-proof chemical goggles and face shield when working with liquid solutions containing chlorine, unless full facepiece respiratory protection is worn. For gaseous chlorine, wear gas-proof goggles and face shield.
- When the potential exists for exposures over 10 ppm, use a National Institute for Occupational Safety and Health (NIOSH) approved self-contained breathing apparatus with a full facepiece operated in pressure demand or other positive pressure mode.

Handling and Storage

- Chlorine reacts explosively or forms explosive compounds with many common substances such as fuel gas, fluorides, ether, turpentine, alcohols, acetylene, hydrogen, ammonia, sulfur, finely divided metals and metal hydrides.
- Store chlorine in tightly closed containers in a cool, well ventilated area away from heat and sunlight. Heat may cause containers to burst.
- Chlorine cylinder temperatures should not exceed 125ºF (52ºC).

Spills and Emergencies

- Most environmental emergencies involve spills of hazardous materials that must be reported to the Department of Natural Resources through a 24-hour hotline (573-634-2436). When reporting a spill, callers can also obtain technical assistance regarding response, containment and cleanup of hazardous materials.
- If chlorine gas or liquid is spilled or leaked, evacuate persons not wearing protective equipment from the area of the spill or leak until the cleanup is complete.
- If gas is leaked, stop the flow of gas. If the source of the leak is a cylinder and the leak cannot be stopped in place, move the leaking cylinder to a safe place in the open air, and repair the leak or allow the cylinder to empty.
- If the leak can be stopped in place, bubble chlorine through a sodium sulfide and excess sodium bicarbonate solution, including a trap in the line.
- For liquid spills, ventilate the area and wash down the spill area with water.

Disposal Methods

Introduce into a large volume and solution of reducing agent (bisulfite, ferrous salts or hypo), neutralize and flush to the sewer with water. Recovery is an option to disposal for chlorine in the case of gases from aluminum chloride electrolysis and chlorine in wastewaters.

Fire Extinguishing

Although chlorine is non-combustible, it is a strong oxidizer and contact with other materials may cause a fire. Extinguish the fire using an agent suitable for the type of surrounding fire. Use water spray to keep fire-exposed containers cool. Containers may explode in a fire.

Emergency First Aid Measures

Eye Contact

- Immediately flush with large amounts of water. Continue without stopping for at least 30 minutes, occasionally lifting upper and lower lids. Seek medical attention immediately.

Skin Contact

- Quickly remove contaminated clothing. Immediately wash skin with large amounts of soap and water. Seek medical attention immediately.

Respiratory

- Remove the victim from the site of the release.
- Begin rescue breathing if breathing has stopped, and CPR if heart activity has stopped.
- Transfer the victim promptly to a medical facility. Medical observation is recommended for 24-48 hours after breathing overexposure, as pulmonary edema may be delayed.

For more information on the Missouri HSEES program, visit the web site at www.dhss.state.mo.us/hsees or contact the HSEES Coordinator at 573-526-1686.

Information for this fact sheet was obtained from the Missouri HSEES Program Five-Year Data Analysis; the Environmental Protection Agency (EPA); the Agency for Toxic Substances and Disease Registry (ATSDR); and the Handbook of Toxic and Hazardous Chemicals and Carcinogens, Third Edition.

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